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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,173	12/01/2003	Nahar Singh	P02,0162-01	2059

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SCHIFF HARDIN & WAITE
Patent Department
6600 Sears Tower
233 South Wacker Drive
Chicago, IL 60606

EXAMINER	
VAUGHN, MEGANN E	
ART UNIT	PAPER NUMBER
2859	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/725,173	SINGH ET AL.	
	Examiner	Art Unit	
	Megann E. Vaughn	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 18-29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 18-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luukkala (US 4,906,107) in view of Saaski et al (US 4307607).

With respect to claim 18, Luukkala discloses in figures 1-3 an immersive probe and a method of sensing temperature through intensity modulation of a light signal using an intensity modulating and remote sensing optic fiber temperature switching immersion probe, comprising the steps of immersing the probe in a container of liquid (oil tanks and cisterns) (col. 1 lines 20-23), having a temperature below a melting point of the chemical/paraffin wax (col.3 lines 1-2); detecting a value of an optical signal generated by transmission of the light signal through the chemical/paraffin wax (col.3 lines 1-2) in a solid state and at the room temperature; detecting an optical signal generated by transmission of the light signal through the chemical/paraffin wax at its melting point and in liquid phase (col.4 lines 47-56); using a receiver 9 to detect the

optical signal from the probe 12 via the optical fiber 11; and signal processing an output of the photo-detector by a signal processing circuit and enabling actuation of a relay dependent on the signal from the probe to at least one of stop a heating process and raise an alarm (col. 4 lines 16-21).

Further, with respect to claim 18: since Luukkala performs detection of an optical signal, in a broad sense, it is considered, that this optical signal would be a maximum optical signal.

Luukkala does not teach that the optical signal is being received and transmitted by a bundle of optical fibers, that the receiver is a photo-detector, and that the probe includes a back-coated concave mirror to reflect the light that is generated by transmission of the light signal through the chemical/wax.

Saaski et al discloses in figures 1, 2, and 4, a very similar temperature immersive probe and method wherein the optical signal is received and transmitted via fiber optic bundles (20, 24, 34b, 34c), wherein that optical signal is received by a photo-detector (24) after being reflected from a back-coated concave mirror (light reflecting face) (48, 50). Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to add these features disclosed by Saaski et al, i.e. replacing the single fibers with fiber bundles, specifying that the receiver is a photo-detector, and adding a back-coated concave mirror, to the immersive probe disclosed by Luukkala because it is well known in the art to replace single optical fibers with bundled fibers in order to increase overall efficiency, as taught by Saaski et al (column 4, lines 16-19), as well as to use a photo-detector, since a photo-detector is a well

known receiver in the art that will perform the same function as the receiver disclosed by Luukkala, i.e. of collecting light and converting it into a corresponding electrical signal, again, as taught by Saaski et al (column 3, lines 60-65). It would have been obvious to coat the concave surface of the probe disclosed by Luukkala with a reflecting coating as taught by Saaski et al in order to ensure that the light transmitted through the chemical/wax disclosed by Luukkala is more accurately reflected back towards the photo-detector as taught by Saaski et al (column 8, lines 16-36)

With respect to claim 19: Luukkala and Saaski et al do not disclose the particular material, i.e., water for the liquid in the container. However, selecting the particular liquid for testing, absent any criticality, is only, considered to be selecting a preferred liquid out of a plurality of liquids, whose temperature needs to be monitored. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the device, disclosed by Luukkala and Saaski et al, to monitor the temperature of the water, such as the water in a hot tub, to prevent unsafe temperatures.

With respect to claims 20 and 21: Luukkala discloses the probe, wherein the chemical is selected from the group consisting of paraffin wax, which has a melting point in the range of 75-85 C (col.4 lines 58-60).

With respect to claim 26: Luukkala discloses the method, wherein the chemical/paraffin wax is opaque at room temperature and becomes transparent at a predetermined higher temperature enabling actuation of a relay to at least one of stop a heating process and raise an alarm (col. 6 lines 7-11).

With respect to claims 22-23: Luukkala discloses the probe, with structure similar as the structure claimed by applicant and thus it is implied that the optical signal propagation in the probe is secure and without any cross talk or interference problem and signal in the probe is unaffected by presence of electrical signals.

With respect to claim 24: Luukkala and Saaski et al do not disclose the particular remote sensing of up to 1 km. However, this particular range, absent any criticality, is only considered to be the "optimum" range of the distance of the probe disclosed by Luukkala and Saaski et al, that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the desired accuracy of signal transmission, the environment, where the probe is used, and particular location of the measuring equipment. See In re Boesch, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the probe with remote sensing up to 1 km in order to locate the receiver at a different, remote location other than the environment being tested.

With respect to claim 25: Luukkala and Saaski et al do not disclose that the output signal increases six times from room temperature. However, this increase in output signal absent any criticality, is only considered to be the "optimum" value of the signal increase used by the Luukkala and Saaski et al, that a person having ordinary skill in the art at the time invention was made would have been able to determine using routine experimental based, among other things, on the type of liquid being tested. See.In re Boesch 205 USPQ 215 (CCPA 1980). Therefore it would have been obvious

to one of ordinary skill in the art at the time the invention was made to provide that the output signal increases six times in order to facilitate the determination that a predetermined temperature has been reached.

With respect to claim 26: Luukkala discloses the method, wherein the chemical/paraffin wax is opaque at room temperature and becomes transparent at a predetermined higher temperature enabling actuation of a relay to at least one of stop a heating process and raise an alarm (col. 6 lines 7-11).

With respect to claim 27: Luukkala discloses the method, wherein the optical signal from the probe is comprised of focused light reflected by the mirror (col.4, lines 40-41).

With respect to claims 28 and 29: Luukkala and Saaski et al disclose a concave mirror having a focal length as stated above with respect to claim 18. Luukkala and Saaski et al do not disclose transmitting the light signal through a cell having a focal length twice the predetermined focal length of the concave mirror. However this focal length of a cell, absent any criticality, is only considered to be the "optimum" value of the focal length of the cell, used by Luukkala and Saaski et al, that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation.

4. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luukkala (US 4,906,107) in view of Saaski et al (US 4307607) as applied to claims 18-29 above, and further in view of Cetas (US 4140393).

With respect to claim 30: Luukkala and Saaski et al disclose the method of sensing temperature through intensity modulation of a light signal using an intensity modulating and remote sensing optic fiber temperature switching immersion probe as disclosed in paragraph 3 with respect to claim 18, further Saaski et al discloses a vacuum cell containing the medium (column 10, lines 1-3). Therefore it would have been obvious to a person having ordinary skill in the art at the time that the invention was made to evacuate the cell disclosed Luukkala as taught by Saaski et al in order to prevent any dirt, foreign particles, etc to enter the cell that may get in the way of the optical signal therefore causing errors in the temperature measurement.

Luukkala and Saaski et al do not specifically disclose two separate bundles of fibers, i.e. the first for transmitting the optical signal to the chemical and the second for receiving the optical signal upon reflecting of the mirror.

Cetas discloses a similar probe thermometer in figures 1 and 2 wherein the optical bundle comprises a first set of fibers (11A) connected to the transmitting source and a second set of fibers (11B) that lead to the photo-detector (column 5, lines 6-8) that are adjacent to each other (see figures). Therefore it would have been obvious to a person having ordinary skill in the art at the time that the invention was made for Luukkala and Saaski et al to use half of the fibers in their fiber bundle to transmit optical signals in one direction and the other half to receive optical signals in the opposite direction as taught by Cetas in order to transmit and receive signals at the same time to sense the temperature more quickly.

With respect to claim 31, Luukkala and Saaski et al and Cetas do not disclose reflecting the transmitted optical signal by a distance of approximately twice the focal length of the concave mirror. However this distance, absent any criticality, is only considered to be the "optimum" value of the reflected distance disclosed by Luukkala and Saaski et al and Cetas, that a person having ordinary skill in the art at the time the invention was made would have been able to determine said distance using routine experimentation.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Wickersheim (US 4560286), Saaski (US 4179927), and Dai et al (US 5822072).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megann E. Vaughn whose telephone number is 571-272-8927. The examiner can normally be reached on 8 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MEV
Patent Examiner Art Unit 2859
9/20/2007

9/24/07

BRIJ SHRIVASTAV
PRIMARY EXAMINER